

Fatigue Impacting Patient Safety: Literature Review and Local Perceptions

Subject Area Topical Issues

EWS 2006

Fatigue Impacting Patient Safety:
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7 Feb 2006

Report Documentation Page				Form Approved OMB No. 0704-0188	
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1. REPORT DATE 07 FEB 2006		2. REPORT TYPE		3. DATES COVERED 00-00-2006 to 00-00-2006	
4. TITLE AND SUBTITLE Fatigue Impacting Patient Safety: Literature Review and Local Perceptions				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) United States Marine Corps,Command and Staff College, Marine Corps University,2076 South Street, Marine Corps Combat Development Command,Quantico,VA,22134-5068				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 16	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Physicians and nurses must make split-second, critical decisions that often have life or death implications for the patient and the provider. Dr. Sophy Wong¹ recalls the following:

A third-year Brown medical student, working at the hospital for 26 hours straight, I was paged to assist in an emergency cesarean [sic] section. I started to nod off, still holding the retractor. The next thing I remember was water hitting my chest and face. I opened my eyes to see a woman on a [sic] operating table and a blue troll-like creature emerging from her abdomen. I screamed. A barrage of curse words escaped from the attending surgeon's mouth, reminding me of exactly where I was. Still, they didn't dismiss me.

While this particular event did not cause harm to the patient, work exhaustion can be dangerous. Unchecked provider fatigue can adversely affect patient safety in healthcare settings, civilian and military alike. Navy military treatment facilities (MTF) in garrison mirror the organizational structure of civilian counterparts; and, just like civilian administrators, navy managers constantly battle the push for higher productivity while managing a seemingly shrinking workforce. Pushing a workforce beyond its capabilities may lead to provider fatigue, and, as a result, medical errors. Current research calls for formally recognizing provider fatigue as a potential cause of medical errors.

Literature Review

As healthcare and its delivery systems become more complex, the opportunities for errors abound. The Institute of Medicine's 2000 report, *To Err Is Human*, documents as many as 98,000 preventable deaths occurring in any given year.² Both civilian and military healthcare providers and administrators are urged to redesign systems to ensure patient safety and reduce the number of medical errors.

Dr. Hofer, Associate Professor at the University of Michigan, defines medical errors as failed processes that cause adverse effects.³ One factor that can be linked to adverse effects is fatigue. Because healthcare takes place around the clock, exceptional physical challenges are placed on the providers.⁴ Human requirements for sleep and an established circadian clock often oppose provider work schedules. Regardless, healthcare providers are charged with the ethical and medical obligation to ensure an acceptable standard of care to all patients.⁵

Fatigue remains difficult to define and measure; however, a complex relationship exists between job overtime, sleep inadequacy, and the type of work performed.^{6,7} Signs and symptoms of fatigue include the following: slowed reaction time, fixation, forgetfulness,

degraded communication and decision-making skills.⁸ Tired and stressed workers also have trouble solving problems, completing quality work, and communicating with co-workers.⁹

Managers have often tried to override circadian rhythms through shift work and overtime, but this causes fatigue and adversely influences decision-making. A recent survey shows that 41% of resident doctors attributed their most serious mistakes to work exhaustion and fatigue.¹⁰ Another study using a virtual-reality surgery simulator found that sleep-deprived surgeons made 20% more errors and operated at a 14% slower pace than well-rested surgeons. Sleep research shows that extended periods without sleep (twenty-four hours or more) result in an impaired cognitive function equivalent to a 0.1 % blood alcohol level.¹¹

Nurses' schedules and shift work can be just as demanding as doctors'. The type of shift work nurses perform - lifting heavy objects and patients - intensifies fatigue, especially coupled with long hours. In a study conducted by the American Nurses Association, over 70% of the nurses surveyed cited the acute and chronic effects of stress and overwork as one of their top three health and safety concerns. Yet nurses continue to be pushed harder, with 67% of them reporting that they work some type of mandatory or unplanned overtime every month, and some (10%)

report working overtime as many as eight or more times a month.¹²

Naval Medicine and Perceptions

The Military Health System Optimization Plan offers a framework for managing resources and the implementation of best-business practices.¹³ This plan, released in 2000, emphasizes three main tenets as follows: 1) effective use of personnel and equipment, 2) aligning resources to deliver the most health services in the most cost-effective manner, and 3) employing the best clinical practices to ensure a high quality of care. The plan provides sound guidance for managers regarding workloads for providers.

Currently, patient to provider ratios in naval medicine are fixed, but allow for flexibility depending on the severity of patients. The commanding officer and the senior medical executive monitor these patient-to-provider ratios at the facility level. For primary-care providers, the patient load is 1500 with 3.5 support staff per provider.

The "Survey: Fatigue in Health Care" (Figure 1) was distributed to a convenience sample of thirty-five providers at Naval Health Clinic, Quantico, to include

doctors, nurses, and physician assistants.¹⁴ Fourteen responded and all responses remain anonymous and confidential. Results are expressed in simple ratios.

Considering the size of the sample for this study, application of the data is limited; however, generalizations and inferences can be made. The primary findings indicate that these providers agree that fatigue is a significant factor in health care. Eighty-seven percent of the participants believe that fatigue is a moderate to very important safety issue. These participants pointed to increased staffing (75%) and better scheduling (38%) as the main solutions. Of note, one-third of those surveyed admitted that patients had suffered because of their fatigue.

Discussion

To date, no study has proven that fatigue alone causes errors that harm patients.¹⁵ More often, studies demonstrate that fatigue impairs human performance. It is extremely difficult for scientific data to make the jump from impairing performance to harming patients.

However, in other fields of work, industries have not waited for absolute proof. In many industries, uniform rules and laws govern overtime and work scheduling to

safeguard against errors and accidents. For example, the transportation industry has recognized fatigue as one important cause behind accident risk. According to the National Highway Traffic Safety Administration, fatigue causes 100,000 crashes annually, resulting in 76,000 injuries and 1,550 deaths.¹⁶ The safety reporting system for the National Aeronautics and Space Administration/ Federal Aviation Association states that 21% of incidents are fatigue-related.¹⁷ The FAA now has strict guidelines restricting on-duty hours for commercial aviators to include no more than thirty hours in flight per week and eight hours of rest between flights.

Conclusion

A leading expert on medical errors, Dr. Leape claims, "Healthcare is the only industry in America that does not believe fatigue degrades performance."¹⁸ Under the current system, providers will repeatedly be placed in exhaustive and stressful situations. Merely restricting work hours will not solve the issue of fatigue-related risk. As such, the Institute of Medicine (IOM) calls for a redesigning of healthcare delivery systems. Inadequate systems must be made safer through the principals set forth by the IOM report, *To Err is Human*.¹⁹ Those principles include

providing strong leadership, respecting human limitations, creating leaner environments, and mitigating risks.

Other strategies include benchmarking and collaboration with other facilities to improve performance of healthcare systems. These suggestions can be tailored to civilian and navy medicine. In fact, all facilities within the Military Health System are already monitored and benchmarked against each other through the use of monthly metric reports and online tools.

Dr. Howard, Associate Professor at Stanford University, requests that providers and administrators no longer disregard the growing body of evidence supporting the link between fatigue and provider performance.²⁰ Accepting this evidence requires a culture change. Intensifying this resistance is the fear of legal action and the tendency to place blame. Clearly, additional research into the relationship between sleep, fatigue, and medical care is needed, as well as the development and implementation of more feasible regulatory measures.

Figure 1

Survey: Fatigue in Health Care

This survey is intended to examine to what extent and in what specific ways fatigue affects health care, especially patient and provider safety. This survey is being administered with permission of @Alertness Solutions, an independent scientific consulting firm. Your responses are anonymous and confidential, and only group data will be communicated with no identifying information. Therefore, please answer all questions as candidly and accurately as possible. Thank you.

1. How much do you believe fatigue is a safety issue within health care?

Not at all Slightly Moderately Very much

2. How important is fatigue as a safety issue compared with other safety issues in your setting?

Much less imp't somewhat less imp't as important somewhat more imp't Much more imp't

3. How much do you believe fatigue affects the following?

- | | | | |
|----|-----------------|------------|----------|
| a. | Patient safety | Not at all | Slightly |
| | Moderately | Very much | |
| b. | Provider safety | Not at all | Slightly |
| | Moderately | Very much | |
| c. | Quality of care | Not at all | Slightly |
| | Moderately | Very much | |
| d. | Staff retention | Not at all | Slightly |
| | Moderately | Very much | |
| e. | Other | Not at all | Slightly |
| | Moderately | Very much | |

4. Rate how the following factors contribute to fatigue in health care:

- | | | | |
|----|--------------------|------------|----------|
| a. | Overtime: | Not at all | Slightly |
| | Moderately | Very much | |
| b. | Night shifts: | Not at all | Slightly |
| | Moderately | Very much | |
| c. | Early start times: | Not at all | Slightly |
| | Moderately | Very much | |

- d. Long shifts: Not at all Slightly
ModeratelyVery much
- e. Being on call: Not at all Slightly
ModeratelyVery much
- f. Changing schedules: Not at all Slightly
ModeratelyVery much
- g. Other: Not at all Slightly
ModeratelyVery much

5. What aspects of your job do fatigue affect?

- ☐ Completing procedures on patients
- ☐ Patient monitoring
- ☐ Interacting with patients
- ☐ Interacting with coworkers
- ☐ Interacting with patients' families and others
- ☐ Charting and record keeping
- ☐ Non-patient-related tasks
- ☐ Other (specify)

6. Have you ever worsened a patient's condition because you were fatigued or tired?

Yes No

7. Have you ever hurt or injured yourself at work due to the effects of fatigue?

Yes No

8. On average, how much sleep do you get on days that you work (i.e., before work)?

Hours

9. On average, how much sleep do you get on days that you are not working?

Hours

10. Have you ever nodded off while working?

Yes No

11. Have you nodded off while driving to or from work in the last year?

Yes No

12. Have you had a near miss or an accident while driving in the last year because you were tired?

Yes

No

13. To what extent does your organization address fatigue issues?

Not at all

Slightly

Moderately

Extensively

14. What barriers exist to addressing fatigue issues in your organization?

- ☐ Economic
- ☐ Logistic
- ☐ Staffing
- ☐ Fatigue is not considered an issue
- ☐ Corporate culture
- ☐ No barriers
- ☐ Other (specify) _____

15. What activities or programs would most help to improve alertness in health care?

- ☐ Better scheduling
- ☐ Increased staffing
- ☐ Work limit policies set by individual organizations
- ☐ Work limit regulations across the industry
- ☐ Education about alertness management and strategies
- ☐ Policies for napping or other alertness strategies
- ☐ A comprehensive alertness management program
- ☐ Other (specify) _____

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